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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/562,399	06/06/2006	Arnulf Krogedal	43315-226893	8479

26694 7590 06/22/2010
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WASHINGTON, DC 20043-9998

EXAMINER

JOHNSON, MATTHEW A

ART UNIT	PAPER NUMBER
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3656

MAIL DATE	DELIVERY MODE
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06/22/2010

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/562,399	Applicant(s) KROGEDAL, ARNULF	
	Examiner MATTHEW A. JOHNSON	Art Unit 3656	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 May 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-32 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 December 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>12/27/2005, 5/18/2010</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the “concave bevel gear having a negative bevel angle relative to a plane perpendicular to the rotation axis of said gear member” (Claims 1 and 2), and “a convex bevel gear with a positive bevel angle relative to a plane perpendicular to the rotation axis” (Claim 2) and “the inner protection hose passing through the inside of the wrist parts has the same total length when arranged in each of a bent and a straight position” claim 10, must be shown or the feature(s) canceled from the claim(s). No new matter should be entered. **Note:** While Figure 4 appears to show a plane P perpendicular to a rotation axis A1 and A2 of the gears, Figures 6a and 6b, which are used to illustrate the “negative bevel angle” show a plane P that is parallel to the axis of rotation of the gears. This discrepancy makes it entirely unclear how the “bevel angle” is being measured. Additionally, regarding claim 10, the drawings do not appear to show the hose having the same length in the bent and straight positions.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet,

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and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

2. Claim 8 is objected to because of the following informalities: The phrase "said gear members has a hollow opening" should read – said gear members have a hollow opening –. Claim 24 is objected to because the phrase "the negative bevel angle of gear member" is grammatically awkward and it is not clear which gear member Applicant is referring to. The examiner requests Applicant carefully review all of the claims for similar grammatical errors. Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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4. Claims 1-32 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Re claim 1: The claim limitation, "a concave bevel gear arranged at a generatrix of the conical surface of least one of said gear members", is unclear rendering the claim indefinite. It is unclear how a bevel gear is arranged at a generatrix of another gear. As written, it appears that a gear is arranged at another gear which is unclear.

5. Claims 1 and 2 recites the limitation "the rotation axis of said gear member" in 10. There is insufficient antecedent basis "the rotation axis" in the claim.

Re claim 3: The limitation, "the negative bevel angle lies in the range between 0 and -20 degrees" is unclear rendering the claim indefinite. Zero is not a negative number and it is unclear how 0 degrees can be a negative bevel angle.

Re claim 5: Claim 5 recites the limitation "the gear member is an annular bevel gear". As written, it is unclear which "gear member" Applicant is referring to since claim 1 recites "one or more gear members".

Re claim 6: Claim 6 recites the limitation, "a said gear member". As written, it is unclear if Applicant is referring to one of the gear members previously recited or if Applicant intends to claim an additional gear.

Re claim 10: Claim 10 recites the limitation, "the inner protection hose passing through the inside of the wrist parts has the same total length when arranged in each of a bent and a straight position". It is unclear how the hose can have the same total length when in a bent position and a straight position.

Re claims 26-28: Claims 26 and 27 recite the limitation, "transfers effect". It is unclear what Applicant intends to claim rendering the claim indefinite. Additionally claims 26-28 recites the limitations "the first part", "the second part" and "third part". There is insufficient antecedent basis for these limitations in the claims. Does Applicant mean "the first wrist part", "second wrist part" and "third wrist part"? For clarity, Applicant must remain consistent in the use of claim terminology.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1-2, 5-6, 8-11 and 24-32, as best understood, are rejected under 35 U.S.C. 102(b) as being anticipated by Dahlquist et al. (USP-4,690,012).

Re claim 1: Dahlquist discloses a robot wrist (10, Fig. 1) with a plurality of rotatable parts (11, 12, 13) arranged in series with each other (Fig. 1), comprising

- at least a first wrist part (11) arranged in use to be mounted to a robot arm (5) or automation machine to enable rotary movement of the first wrist part about a first axis (D-D),
- a second wrist part (12) journaled in the first wrist part (Fig. 2), wherein each wrist part is arranged with one or more gear members (67, 68, 37,

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69, 73, 74, 60, 27, 55) to drive a said rotary movement of any said wrist part relative to said another wrist part (Fig. 2), and

- a concave bevel gear (68, 37, 74) arranged at a generatrix of the conical surface of least one of said gear members (Fig. 2) said concave bevel gear having a negative bevel angle (as shown in Fig. 2, gears 68, 37 and 74 are concave bevel gears having internally formed teeth that are angled inwardly relative to a plane perpendicular to their rotation axis) relative to a plane perpendicular to the rotation axis of gear 68, 37, 74) perpendicular to the rotation axis of said gear member (Fig. 2).

Re claim 2: Dahlquist discloses at least one of said gear members is arranged with a convex bevel gear (67, 27, 55, 60) with a positive bevel angle relative to a plane perpendicular to the rotation axis (Fig. 2) and at least one other said gear member (68, 37, 74) is arranged as a concave bevel gear with a negative bevel angle (as shown in Fig. 2, gears 68, 37 and 74 are concave bevel gears having internally formed teeth that are angled inwardly relative to a plane perpendicular to their rotation axis).

Re claim 5: Dahlquist discloses the gear member is an annular bevel gear (gears 68, 37, and 74 are annular bevel gears, Fig. 2).

Re claim 6: Dahlquist discloses said second wrist part (12) is arranged with a said gear member (gear 68 or 37, Fig. 2) with the negative bevel angle.

Re claim 8: Dahlquist discloses each of said gear members has a hollow opening through which an inner protection hose is arranged (Fig. 2, C1 L48-50, C2 L8-13, C4 L43-47).

Re claim 9: Dahlquist discloses the inner protection hose is arranged so as to pass through the inside of the wrist parts arranged in a single circular arc when the wrist is in a bent position (Fig. 3).

Re claim 10: Dahlquist discloses the inner protection hose passing through the inside of the wrist parts has the same total length when arranged in each of a bent and a straight position (Figs. 2 and 3).

Re claim 11: Dahlquist discloses the inner protection hose is a hose with a substantially cylindrical wall (see C4 L43-47; cable, protective gas conduits and wires are inherently cylindrical).

Re claim 24: Dahlquist discloses the negative bevel angle of gear member of said second wrist part (gear 68 or 37) is arranged facing a third wrist part (13).

Re claim 25: Dahlquist discloses the third wrist part (13) is journalled in the second wrist part (12) to enable rotary movement of the third wrist part relative the second wrist and the second wrist part relative the first (Fig. 2).

Re claim 26: Dahlquist discloses a gear member (gears 67, 44) of the first part (11) is arranged to engage a gear member (gears 68, 37) of the second part such that

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the second wrist part (12) transfers effect to rotatably drive a gear member (74) of the third wrist part (13) engaged by a second gear member (73 or 69) of the second part.

Re claim 27: Dahlquist discloses the second part (12) gear members (68 or 37) transferring effect to the third part gear member are arranged in the second part such that their axes of rotation are at an inclined angle to each other (Fig. 3).

Re claim 28: Dahlquist discloses a first part gear member (67, 44) and a third part gear member (60) are convex bevel gears with a positive gear angle (Fig. 3) and a second part gear member (68, 37) is a concave bevel gear with a negative bevel angle (Figs. 2 and 3).

Re claims 29-32: The examiner notes that the recitations of claims 29-32 are intended use limitations and are given very limited patentable weight. A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. Dahlquist discloses a robotic arm that is capable of performing any of the functions of claims 29-32.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

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the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 3-4 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dahlquist et al. (USP-4,690,012).

Re claims 3-4: While Dahlquist does indeed disclose concave bevel gears (37, 68, 74) that comprises internally formed teeth (i.e. concave) that appear to formed at a negative angle of at least -10 degrees, Dahlquist does not explicitly disclose the angle of the bevel gears.

Dahlquist discloses the claimed invention except for identical ranges as claimed. It would have been obvious to a person having ordinary skill in the art at the time of the invention to have formed the concave bevel gears of Dahlquist with a negative bevel angle within the claimed ranges, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, USPQ 233.

Re claim 7: Dahlquist discloses wherein the negative bevel angle of the gear member (68 or 37) of said second wrist part (12) is arranged to engage a gear member (gears 68, 37 engage gears 67 and 44) of said first wrist part (11).

10. Claims 12-14, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Dahlquist et al. (USP-4,690,012) in view of Haniya et al. (USP-6,734,367).

Re claims 12-14: While Dahlquist does indeed disclose an inner protection hose (C4 L43-47), Dahlquist does not explicitly disclose the inner protection hose is a hose with a cylindrical wall that has a straight and parallel wall cross-section, the inner protection hose is a hose with a wall cross-section in the form of a wave, the inner protection hose comprises an articulated hose comprising circular sections of at least two different diameters.

Haniya teaches a protective hose for a robot (see Abstract and Fig. 2) wherein the inner protection hose (10) is a hose with a cylindrical wall that has a straight and parallel wall cross-section(see Figs. 1-4), the inner protection hose is a hose with a wall cross-section in the form of a wave (Figs. 1-4), the inner protection hose comprises an articulated hose comprising circular sections of at least two different diameters (Figs. 1-4), for the purpose of protecting the inner cables from mechanical damage (C1 L13-26).

It would have been obvious to a person having ordinary skill in the art at the time of the invention to have included in the device of Dahlquist, an inner protection hose with a cylindrical wall that has a straight and parallel wall cross-section, a wall cross-section in the form of a wave and the hose having circular sections of at least two different diameters, as taught by Haniya, for the purpose of protecting the inner cables from mechanical damage (C1 L13-26).

11. Claims 15-23, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Dahlquist et al. (USP-4,690,012) in view of Haniya et al. (USP-6,734,367) further in view of Fisher (USP-6390141).

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Re claims 15-23: Dahlquist in view of Haniya disclose all of the claim limitations as described above.

While Haniya teaches a plurality of hoses and/or cables are arranged inside said inner protection hose, the plurality of hoses and/or cables are twisted to a predetermined extent through 180 degrees inside the inner protection hose and comprise any from the list of: hose, wire, feed rod, cable (C1 L19-26), Dahlquist in view of Haniya does not disclose the inner protection hose is formed of a polymeric material combined with at least one metal reinforcing member, the inner protection hose comprises a fluoropolymer, the metal reinforcing member comprises a plurality of metal rings, the metal reinforcing member comprises any of a spiral wire or a helical wire, the metal rings, spiral wire or helical wire of the hose are attached to the outside surface of the polymeric material, the rings, spiral wire or helical wire of the hose are embedded in the polymeric material.

Fisher teaches a protective hose (10) formed of a polymeric material (C3 L48-53) combined with at least one metal reinforcing member (C3 L18-22), the inner protection hose comprises a fluoropolymer C3 L48-53), the metal reinforcing member comprises a plurality of metal rings (C3 L10-39), the metal reinforcing member comprises any of a spiral wire or a helical wire (C3 L10-39), the metal rings, spiral wire or helical wire of the hose are attached to the outside surface of the polymeric material (C3 L10-61), the rings, spiral wire or helical wire of the hose are embedded in the polymeric material C3 L10-61), for the purpose of providing a flexible hose that is properly reinforced to prevent collapse of the protective hose (C3 L10-61 and Abstract).

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It would have been obvious to a person having ordinary skill in the art at the time of the invention to have modified the device of Dahlquist and Haniya, such that the inner protection hose is formed of a polymeric material combined with at least one metal reinforcing member, the inner protection hose comprises a fluoropolymer, the metal reinforcing member comprises a plurality of metal rings, the metal reinforcing member comprises any of a spiral wire or a helical wire, the metal rings, spiral wire or helical wire of the hose are attached to the outside surface of the polymeric material, the rings, spiral wire or helical wire of the hose are embedded in the polymeric material, as taught by Fisher, for the purpose of providing a flexible hose that is properly reinforced to prevent collapse of the protective hose (C3 L10-61 and Abstract).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MATTHEW A. JOHNSON whose telephone number is (571)272-7944. The examiner can normally be reached on Monday - Friday 9:00a.m. - 5:30p.m. EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Ridley can be reached on 571-272-6917. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/MATTHEW A JOHNSON/
Examiner, Art Unit 3656

/Richard WL Ridley/

Supervisory Patent Examiner, Art Unit 3656/Richard WL Ridley/

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